

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended) An infrared reflective coated article comprising:

a substrate;

a dielectric layer sputter deposited over the substrate, the layer comprising a first zinc stannate film deposited over the substrate having zinc in weight percent range of equal to and greater than 10 and equal to and less than 90, and tin in the weight percent range of equal to and less than 90 and equal to and greater than 10, and an electrical enhancing film deposited over the zinc stannate film, the electrical enhancing film selected from the group of films consisting of zinc oxide, tin oxide film and a second zinc stannate film wherein the composition of the first zinc stannate film is at least about 5 weight percent different than the composition of the second zinc stannate film, and

an infrared reflective layer deposited on the dielectric layer,

a metal primer layer over the infrared reflective layer;

a second dielectric layer over the primer layer; and

a protective layer of at least two films selected from the group consisting of metal-containing films, which are from different transition metals of Groups 4, 5, 6, or 10 of the Periodic Table of ~~Elements; and Elements,~~ and silicon-containing ~~films; and films,~~ and metal and silicon ~~films; and films,~~ and films of metal and metal-oxy ~~materials; and materials,~~ films of metal and silicon ~~oxy materials; and oxy-materials,~~ and films of silicon and metal-oxy materials, ~~and films of silicon and silicon oxy materials; and oxy-materials,~~ and films of metal oxy and silicon ~~oxy materials; where oxy materials,~~ where the oxy materials are selected from the group consisting of oxides and oxynitrides, and wherein the protective layer is in a position where it can perform the protective function for providing durability to the dielectric layer, infrared reflective layer, metal primer layer, and second dielectric layer.

Claim 2 (original) The coated article of claim 1 wherein the infrared reflective metal is silver and the silver is deposited on the zinc oxide, tin oxide film.

Claim 3 (previously presented) The coated article of claim 1 wherein the infrared reflective layer is a silver film and the silver film is deposited on the second zinc stannate film.

Claim 4 (currently amended) The coated article of claim 1 wherein the dielectric layer is a first dielectric layer~~layer,~~ and the infrared reflective layer is a first infrared reflective layer~~,~~ and further including:

~~_____a~~the metal primer layer is over the first infrared reflective layer~~;~~layer,
and
~~_____a~~second dielectric layer over the primer layer and the protective layer is an overcoat over the second dielectric layer.

Claim 5 (currently amended) The coated article of claim 4 wherein the second dielectric layer is a zinc stannate film having 10-90 weight percent zinc and 90-10 weight percent tin.

Claim 6 (currently amended) The coated article of claim 1 wherein the dielectric layer is a first dielectric layer and the infrared reflective layer is a first infrared reflective layer and further including:

- a first metal primer layer over the first infrared reflective metal layer;
- a second dielectric layer over the first primer layer;
- a second infrared reflective layer over the second dielectric layer;
- a second metal primer layer over the second infrared reflective layer;
- a third dielectric layer over the second metal primer layer; and
- the protective layer is over the third dielectric layer.

Claim 7 (currently amended) The coated article of claim 6 wherein at least one of the second and third dielectric layers includes a zinc stannate film having 10-90 weight percent zinc and 90-10 weight percent tin.

Claim 8 (currently amended) The coated article ~~coating stack~~ of claim 1 wherein the dielectric layer is a first dielectric layer and the infrared reflective layer is a first infrared reflective layer and further including:

- a first metal primer layer over the first reflective layer;
- a second dielectric layer over the first metal primer layer, the second dielectric layer comprising a first dielectric film and a zinc stannate film defined as a first zinc stannate film, the first zinc stannate film having zinc in the weight percent range of equal to and greater than 10 and equal to and less than 90 and tin in the weight percent range of equal to and greater than 10 and equal to and less than 90, the second dielectric layer deposited over the first metal primer layer;

a second infrared reflective layer deposited over the second dielectric layer;

a second metal primer layer deposited over the second infrared reflective layer;

a third dielectric layer deposited over the second primer layer; and
the protective layer is over the third dielectric layer.

Claim 9 (currently amended) The coated article ~~coating stack~~ of claim 8 wherein the first dielectric film of the second dielectric layer ~~comprises~~ is selected from the group consisting of a zinc oxide film, a film, a zinc oxide, tin oxide film or film, and a zinc stannate film defined as a second zinc stannate film, the second zinc stannate film having a composition different than the composition of the first zinc stannate film of the second dielectric layer.

Claim 10 (currently amended) The coated article ~~coating stack~~ of claim 9 wherein the second zinc stannate film of the second dielectric layer has zinc in the weight percent range of equal to and greater than 60 and equal to and less than 90 and tin in the weight percent of equal to and greater than 10 and equal to and less than 40, and the third dielectric layer is a zinc stannate film.

Claim 11 (currently amended) The coated article ~~coating stack~~ of claim 1 wherein the dielectric layer is a first dielectric layer and the infrared reflective layer is a first infrared reflective layer and further including:

a first metal primer layer over the first reflective layer;
a second dielectric layer over the first metal primer film;
a second infrared reflective layer over the second dielectric layer;
a second metal primer layer over the second infrared reflecting metal

layer;

a third dielectric layer over the second metal primer layer, the third dielectric layer comprising a first dielectric film and a zinc stannate film defined as a first zinc stannate film, the first zinc stannate film having zinc in a weight percent with the range of equal to and greater than 10 and equal to and less than 90 and tin within the weight percent range of equal to and less than 90 and equal to and greater than 10, the third dielectric film deposited over the second metal primer; and
the protective layer overlies the third dielectric film.

Claim 12 (currently amended) The coated article of claim 11 wherein the first dielectric film of the third dielectric layer is selected from the group consisting of a zinc oxide film, ~~a film, a zinc oxide, tin oxide film or film,~~ and a zinc stannate film defined as a second zinc stannate film, the second zinc stannate film having a composition different than the composition of the first zinc stannate film of third dielectric layer.

Claim 13 (currently amended) The coated article of claim 12 wherein the second zinc stannate film of the third dielectric layer has zinc in the weight percent range of equal to and greater than 60 and equal to and less than 90 and tin in the weight percent range of equal to and greater than 10 and equal to and less than 40.

Claim 14 (currently amended) The coated article of claim 1 wherein the dielectric layer is a first dielectric layer ~~and layer,~~ the infrared reflective layer is a first infrared reflective layer, ~~and further including:~~

_____ the metal primer layer is a first metal primer layer over the first reflective layer; and the

_____ a second dielectric layer is over the first metal primer layer, the second dielectric layer comprising a first dielectric film and a zinc stannate film defined as a first zinc stannate film, the first zinc stannate film having zinc in a weight percent within the range of equal to and greater than 10 and equal to and less than 90 and tin within the weight percent range of equal to and less than 90 and equal to and greater than 10, the second dielectric layer deposited over the first metal primer layer, and further comprising;

 a second infrared reflective layer over the first zinc stannate film of the second dielectric layer;

 a second metal primer layer over the second infrared reflective layer;

 a third dielectric layer over the second metal primer layer, the third dielectric layer comprising a first dielectric film and a zinc stannate film defined as a first zinc stannate film, the first zinc stannate film having zinc in a weight percent within the range of equal to and greater than 10 and equal to and less than 90 and tin within the weight percent range of equal to and less than 90 and equal to and greater than 10, the third dielectric layer deposited over the second metal primer layer; and

 the protective layer overlies the first zinc stannate film of the third dielectric layer.

Claim 15 (currently amended) The coated article ~~coating stack~~ of claim 14 wherein the first dielectric film of the second dielectric layer and the first dielectric film of the third dielectric layer each has a film selected from the group consisting of zinc oxide film, zinc film, a zinc oxide, tin oxide film or film, and a second zinc stannate film having a composition different than the composition of the first zinc stannate film in the their ~~respective same~~ second or third dielectric layer.

Claim 16 (currently amended) The coated article ~~coating stack~~ of claim 15 wherein the second zinc stannate film of the first and second dielectric layer each include zinc in the weight percent range of equal to and greater than 60 and equal to and less than 90 and tin in the weight percent of equal to and greater than 10 and equal to and less than 40.

Claim 17 (currently amended) The coated article ~~coating stack~~ of claim 14 wherein the second dielectric layer further includes a third dielectric film over the first zinc stannate film of the second dielectric layer.

Claim 18 (currently amended) The coated article ~~coating stack~~ of claim 15 wherein the second dielectric layer further includes a third dielectric film over the first zinc stannate film of the second dielectric layer wherein the third dielectric film of the second dielectric layer is a film selected from the group consisting of a zinc oxide film, a zinc oxide, tin oxide film and a zinc stannate film defined as a third zinc stannate film, the third zinc stannate film has a composition different than the composition of the first zinc stannate film of the second dielectric layer closest to the third zinc stannate film.

Claim 19 (currently amended) The coated article ~~coating~~ of claim 15 wherein the ~~second dielectric film of the second dielectric layer and the second dielectric film of the third dielectric second layer each comprises~~ further includes a third dielectric film over the first zinc stannate film of the second dielectric layer, wherein the third dielectric film of the second dielectric layer is selected from the group consisting of a zinc oxide film, a film, a zinc oxide, tin oxide film or a second film, and a second zinc stannate film defined as a third zinc stannate film, the third zinc stannate film of the second dielectric layer having a composition different than the composition of the first zinc stannate film of second ~~third~~ dielectric layer.

Claim 20 (currently amended) The coated article ~~coating stack~~ of claim 19 wherein the first and third dielectric films of the second dielectric layer and the first dielectric film of the third dielectric layer each include zinc in the weight percent range of equal to and greater than 60 and equal to and less than 90 and tin in the weight percent of equal to and greater than 10 and equal to and less than 40.

Claim 21 (currently amended) The coated article ~~coating stack~~ of claim ~~17-14~~ wherein the substrate is a glass piece and the ~~second-first~~ zinc stannate film of the first dielectric layer is on the glass piece and has a thickness in the range of 230 ± 40 Angstroms Å; the ~~first-zinc-stannate~~electrical enhancing film of the first dielectric layer is on the ~~second-first~~ zinc stannate film of the first dielectric layer and has a thickness in the range of 80 ± 40 Å; the first infrared reflective metal layer is a first silver film deposited on the ~~first-zinc-stannate~~electrical enhancing film of the first dielectric layer and has a thickness in the range of 110 ± 30 Å, the metal primer layer is a titanium film deposited on the first silver layer and has a thickness in the range of 17-26 Å; the first dielectric film of the second dielectric layer is deposited on the titanium film and has a thickness in the range of 80 ± 40 Å; the first zinc stannate film of the second dielectric layer is deposited on the first dielectric film of the second dielectric layer and has a thickness in the range of 740 ± 40 Å; the second infrared reflective metal layer is a second silver film deposited on the ~~second dielectric~~first zinc stannate film of the second dielectric layer and has a thickness in the range of 110 ± 38 Å; the second primer film is a titanium film deposited on the second silver layer and having a thickness in the range of 18 - 31 Å; the first dielectric film of the third dielectric layer is deposited on the second titanium film and has a thickness in the range of 80 ± 40 Å; the first zinc stannate film layer of the third dielectric layer is deposited on the first dielectric film of the third dielectric layer and has a thickness in the range of 120 ± 40 Å, and the protective layer ~~is~~includes a titanium metal film deposited on the first zinc stannate film layer of the third dielectric layer and has a thickness in the range of 29 ± 3 Å.

Claim 22 (currently amended) The coated article of claim 1 wherein the protective layer has at least two films selected from the group consisting of a metal of titanium, zirconium, niobium, tantalum, chromium, nickel or alloys thereof; ~~and thereof, and a~~ metal oxy material of titanium oxides, titanium oxynitride, zirconium oxides, zirconium oxynitrides, niobium oxides, niobium oxynitrides, tantalum oxide, tantalum oxynitride, chromic oxides, chromic oxynitrides, nickel oxide, ~~or nickel oxynitride~~;

~~and silicon oxide; and silicon dioxide; and silicon aluminum nitride-nickel oxynitride,~~
silicon oxide, silicon dioxide, and silicon aluminum nitride, and combinations and mixtures of any two or more of these.

Claim 23 (currently amended) A coated article comprising:

- a substrate;
- a first dielectric layer over the substrate;
- a first infrared reflective layer over the first dielectric layer;
- a first metal primer layer over the first infrared reflective layer;
- a second dielectric layer over the first metal primer, the second dielectric layer having a first dielectric film selected from the group consisting of ~~zinc~~ of a zinc oxide, tin oxide film and a first zinc stannate film, and a second dielectric film ~~the second dielectric film~~ having a composition different than the first dielectric film of the second dielectric layer;
- a second infrared reflective layer over the second dielectric layer;
- a second primer layer over the second reflective layer;
- a third dielectric layer over the second metal primer layer; and
- a protective layer of at least two films selected from the group consisting of metal-containing films, which are selected from different transition metals of Groups 4, 5, 6 or 10 of the Periodic Table of ~~Elements; and Elements,~~ silicon-containing ~~films; and films,~~ metal and silicon ~~films; and films,~~ films of metal and metal-oxy ~~materials; and materials,~~ films of metal and silicon oxy ~~materials; and oxy-materials,~~ films of silicon and metal-oxy ~~materials; and materials,~~ films of silicon and silicon oxy ~~materials; oxy-materials,~~ and films of metal oxy and silicon oxy materials, where the oxy-materials are oxides or oxynitrides and wherein the protective layer is in a position where it can perform the protective function for providing durability to the dielectric layers, infrared reflective layers, and metal primer layers.

Claim 24 (original) The coated article of claim 23 wherein the first dielectric layer includes a zinc stannate film, the second dielectric film of the second dielectric layer is a zinc stannate film and the third dielectric layer includes a zinc stannate film, each of the zinc stannate films having zinc in the weight percent range of 10-90 and tin in the weight percent range of 90-10.

Claim 25 (original) The coated article of claim 24 wherein the first dielectric film of the second dielectric layer is the first zinc stannate film having zinc in the weight percent

range of equal to and greater than 90 and equal to and less than 60 and tin in the weight percent range of equal to and greater than 10 and equal to and less than 40.

Claim 26 (currently amended) A coated article comprising:

- a substrate;
- a first dielectric layer over the substrate;
- a first infrared reflective layer over the first dielectric layer;
- a first metal primer layer over the first infrared reflective layer;
- a second dielectric layer over the first metal primer layer;
- a second infrared reflective layer over the second dielectric layer;
- a second metal primer layer over the second reflective metal layer;
- a third dielectric layer having a first dielectric film selected from the group consisting of ~~zinc oxide film~~; a zinc oxide film, a zinc oxide, tin oxide film and zinc film, and a zinc stannate film, and a second dielectric film overlying the first dielectric film, the second dielectric film having a composition different from the first dielectric film; and

the protective layer overlying the third dielectric layer where the protective layer is at least two films selected from the group consisting of: metal-containing films, which are- of different transition metals of Groups 4, 5, 6 or 10 of the Periodic Table of ~~Elements~~; and Elements, silicon-containing ~~films~~; and films, metal and silicon ~~films~~; ~~films~~ films, films of metal and metal-oxy materials; ~~films~~ materials, films of metal and silicon oxy materials; ~~films~~ oxy-materials, films of silicon and metal-oxy materials; ~~films~~ materials, films of silicon and silicon oxy materials; ~~films~~ oxy-materials, and films of metal oxy and silicon oxy materials; ~~where the oxy materials are selected materials~~, where the oxy-materials are selected from the group of oxides or oxynitrides.

Claim 27 (original) The coated article of claim 26 wherein the first and second dielectric layers are each a zinc stannate film, and the second dielectric film of the third dielectric layer is a zinc stannate film and each of the zinc stannate films has zinc in the weight percent range of 10-90 and tin in the weight percent range of 90-10.

Claim 28 (previously presented) The coated article of claim 27 wherein the first dielectric film of the third dielectric layer has zinc in the weight percent range of equal to and greater than 90 and equal to and less than 60 and tin in the weight percent range of equal to and greater than 10 and equal to and less than 40.

Claim 29 (currently amended) A coated article comprising:

- a substrate;
- a first dielectric layer over the substrate;
- a first infrared reflective layer over the first dielectric layer;
- a first primer layer over the first reflective metal layer;
- a second dielectric layer having a first dielectric film selected from the group consisting of a zinc oxide, tin oxide film and a first zinc stannate film, and a second dielectric film overlying the first dielectric film having a composition different than the first dielectric film of the second dielectric layer;
- a second infrared reflective layer over the second dielectric layer;
- a second primer layer over the second reflective layer;
- a third dielectric layer over the second metal primer layer, the third dielectric layer having a first dielectric film selected from the group consisting of a zinc oxide, tin oxide film and zinc stannate film, and a second dielectric film, the second dielectric film of the third dielectric layer ~~have~~having a composition different than the composition of the ~~second-first~~ dielectric film of the third dielectric layer; and
- the protective layer overlying the third dielectric layer where the protective layer is at least two films selected from the group consisting of: metal-containing and silicon-containing films, which are different metals, or metal and silicon, or metal and metal-oxy materials, or metal and silicon oxy-materials, or silicon and metal-oxy, or silicon and silicon oxy-materials, or metal oxy and silicon oxy materials, where the oxy materials are selected from the group consisting of oxides and oxynitrides and where the metal is selected from the group consisting of a transition metal of Groups 4, 5, 6 or 10 of the Periodic Table of Elements.

Claim 30 (previously presented) The coated article of claim 29 wherein the first dielectric layer, the second dielectric film of the second and third dielectric layers are each a zinc stannate film having zinc in the weight percent range of 10-90 and tin in the weight percent range of 90 -10.

Claim 31 (previously presented) The coated article of claim 30 wherein the first dielectric film of the second and third dielectric layers are each a zinc stannate film having zinc in the weight percent range of equal to and greater than 90 and equal to and less than 60 and tin in the weight percent range of equal to and greater than 10 and equal to and less than 40.

Claim 32 (previously presented) The coated article of claim 30 wherein the coated article is a transparency.

Claim 33 (previously presented) The coated article of claim 32 wherein the coated article is an automotive transparency.

Claim 34 (previously presented) The coated article of claim 33 wherein the automobile transparency is an automotive windshield having a pair of glass sheets laminated together and one of the sheets is fabricated from the substrate having the coating.

Claims 35-41 (canceled)

Claim 42 (currently amended) ~~The A-coated article of Claim-claim~~ 1, wherein the protective layer has a thickness ~~for the films of~~ about 5 to about 60 Å for the metal or silicon ~~film-films~~ and about 20 to about 50 Å, ~~for~~ for the metal oxy-material or silicon oxy-material ~~film-films~~.

Claim 43 (currently amended) ~~The A-coated article of Claim-claim~~ 42, wherein the protective layer has a thickness ~~for the films of~~ 10 to about 30 Å for the metal or silicon ~~film-films~~ and 30 to 40 Å for the metal oxy-material or silicon oxy-material ~~film-films~~.

Claim 44 (currently amended) ~~The A-coated article of Claim-claim~~ 1, wherein the protective layer provides chemical durability.

Claim 45 (currently amended) ~~The A-coated article of Claim-claim~~ 1, wherein the protective layer provides mechanical durability.

Claim 46 (new) The coated article of claim 15 wherein the third dielectric layer further includes a third dielectric film over the first zinc stannate film of the third dielectric layer, wherein the third dielectric film of the third dielectric layer is selected from the group consisting of a zinc oxide film, a zinc oxide, tin oxide film, and a zinc stannate film defined as a third zinc stannate film, the third zinc stannate film of the third dielectric layer having a composition different than the composition of the first zinc stannate film of third dielectric layer.

Claim 47 (new) The coated article of claim 21 wherein the protective coating further includes a titanium oxide film.

Claim 48 (new) An infrared reflective coated article comprising:

a glass substrate;

a first dielectric layer over the substrate, the first dielectric layer comprising a dielectric film over a zinc stannate film, wherein the zinc stannate film of the first dielectric layer has a thickness in the range of 230 ± 40 Angstroms Å and has zinc in weight percent range of equal to and greater than 10 and equal to and less than 90 and tin in the weight percent range of equal to and less than 90 and equal to and greater than 10, and the dielectric film of the first dielectric layer has a thickness in the range of 80 ± 40 Å and is different from the zinc stannate film of the first dielectric layer;

a first infrared reflective layer over the first dielectric layer, wherein the first infrared reflective metal layer is a first silver film and has a thickness in the range of 110 ± 30 Å;

a first metal primer layer over the first infrared reflective layer, wherein the metal primer layer is a titanium film and has a thickness in the range of 17-26 Å;

a second dielectric layer over the first metal primer layer, the second dielectric layer comprising a zinc stannate film over a dielectric film, wherein the dielectric film of the second dielectric layer has a thickness in the range of 80 ± 40 Å, the zinc stannate film of the second dielectric layer has a thickness in the range of 740 ± 40 Å and has zinc in a weight percent within the range of equal to and greater than 10 and equal to and less than 90 and tin within the weight percent range of equal to and less than 90 and equal to and greater than 10, and the dielectric film of the second dielectric layer is different from the zinc stannate film of the second dielectric layer;

a second infrared reflective layer over the second dielectric layer, wherein the second infrared reflective metal layer is a second silver film and has a thickness in the range of 110 ± 38 Å;

a second metal primer layer over the second infrared reflective layer, wherein the second primer film is a titanium film and has a thickness in the range of 18 - 31 Å;

a third dielectric layer over the second metal primer layer, the third dielectric layer comprising a zinc stannate film over a dielectric film, wherein the dielectric layer of the third dielectric layer has a thickness in the range of 80 ± 40 Å,

the zinc stannate film of the third dielectric layer has a thickness in the range of $120 \pm 40\text{\AA}$ and has zinc in a weight percent within the range of equal to and greater than 10 and equal to and less than 90 and tin within the weight percent range of equal to and less than 90 and equal to and greater than 10, and the dielectric film of the third dielectric layer is different from the zinc stannate film of the third dielectric layer; and
a protective layer of titanium metal film over the third dielectric layer and having a thickness in the range of $29 \pm 3\text{\AA}$.